

CLAIMS

What is claimed is:

1. A method of providing a user interface for a computing device, comprising the steps of:
 - 5 projecting a user input display from a projector of the computing device onto a first surface; and
 - projecting a user output display from the projector of the computing device onto a second surface, wherein the first surface and the second surface are disposed in different planes.
- 10 2. The method of claim 1, wherein the computing device is a pervasive computing device.
3. The method of claim 1, wherein the user input display and the user output display are originally projected as a single image from a single projector.
- 15 4. The method of claim 3, further comprising the step of reflecting a portion of the originally projected single image with a mirror system in the computing device, which causes the splitting of the originally projected single image into the user input display and the user output display.
5. The method of claim 4, wherein, in the step of reflecting a portion of the
20 originally projected single image, a reflected portion of the image is the user output display and an unreflected portion of the image is the user input display.
6. The method of claim 4, wherein the step of reflecting a portion of the originally projected single image further comprises:

splitting the user output display from the user input display with a first mirror of the mirror system;

receiving a reflection of the user output display from the first mirror at a second mirror of the mirror system; and

5 projecting the user output display from the second mirror to the second surface.

7. The method of claim 4, wherein the step of projecting the user output display comprises projecting a large image from the mirror system when a short distance exists between the computing device and the second surface.

8. The method of claim 1, wherein the projector is a micro projector.

10 9. The method of in claim 1, wherein the first surface is in a plane disposed in front of the computing device, the second surface is in a plane disposed behind the computing device, and the second surface is orthogonal to the first surface.

10. The method of claim 1, wherein the user input display comprises an image of a keyboard.

15 11. The method of claim 1, wherein the first surface is a horizontal surface and the second surface is a vertical surface.

12. The method of claim 1, further comprising the step of providing audio feedback from the computing device in response to intercepting sensors of the virtual keystroke detection system, over a virtual key in the user input display.

13. The method of claim 1, further comprising the step of providing visual feedback on the user output display in response to intercepting sensors of the virtual keystroke detection system, over a virtual key of the user input display.

14. The method of claim 1, further comprising the step of providing visual
5 feedback on the user input display in response to intercepting sensors of the virtual keystroke detection system, over a virtual key of the user input display.

15. The method of claim 1, wherein the user input display comprises an image of a scratch pad.

16. The method of claim 1, wherein the user input display comprises an image of
10 a pointing device.

17. A method of providing a user interface for a computing device, comprising the steps of:

projecting a user input display from a projector of a computing device onto a surface; and

15 projecting a user output display from the projector of the computing device onto the surface, wherein the user input display and the user output display are projected from a single projector onto the surface.

18. The method of claim 17, wherein the computing device is a pervasive
20 computing device.

19. The method of claim 17, wherein the projector is a micro projector.

20. The method of claim 17, wherein the steps of projecting the user input display and user output display comprise projecting the user input display between the user and the computing device and projecting the user output display between the user input display and the computing device.

5 21. The method of claim 17, further comprising the step of providing audio feedback from the computing device in response to interrupting sensors of the keystroke detection system, over a virtual key in the user input display.

22. The method of claim 17, further comprising the step of providing visual feedback on the user output display in response to interrupting sensors of the keystroke
10 detection system, over a virtual key in the user input display.

23. The method of claim 17, further comprising the step of providing visual feedback on the user input display in response to interrupting sensors of the keystroke detection system, over a virtual key in the user input display.

24. A computing device, comprising:
15 a projector that projects an image; and
 a mirror system disposed in accordance with the projector, wherein the mirror system reflects a portion of the image from the projector, projecting a nonreflected portion of the image to a first surface and a reflected portion of the image to a second surface, and wherein the projected reflected portion of the image and the projected
20 nonreflected portion of the image provide a virtual user interface for the computing device.

25. The computing device of claim 24, wherein the computing device is a pervasive computing device.

26. The computing device of claim 24, wherein the mirror system comprises:
a first mirror that intercepts a portion of the image from the projector; and
5 a second mirror that receives the reflected portion of the image from the first mirror and projects the reflected portion of the image to the second surface.

27. The computing device of claim 24, wherein the projector is a micro projector.

28. The computing device of claim 24, wherein the nonreflected portion of the image is projected in front of the pervasive computing device between the computing
10 device and the user.

29. The computing device of claim 24, wherein the reflected portion of the image is projected behind the computing device.

30. The computing device of claim 24, wherein the first surface is perpendicular to the second surface.

15 31. The computing device of claim 24, wherein the nonreflected portion of the projected image comprises a virtual keyboard image.

32. The computing device of claim 24, wherein the reflected portion of the projected image comprises a user output display.

33. The computing device of claim 24, further comprising a key feedback mechanism.

34. A computing device, comprising:
a projector that projects an image from the computing device to a surface, wherein
5 the image comprises a user input display and a user output display.

35. The computing device of claim 34, wherein the computing device is a pervasive computing device.

36. The computing device of claim 34, wherein the projector is a micro projector.

37. The computing device of claim 34, wherein the user input display is disposed
10 between a user and the computing device, and the user output display is disposed between
the user input display and the computing device.